

What is claimed is:

1. A leather-like sheet comprising the integration of entanglement of a woven or knitted fabric and an ultrafine fiber of 0.0001 to 0.5 dtex, wherein

at least one face of the leather-like sheet is substantially composed of said ultrafine fibers, and said woven or knitted fabric comprises of a conjugate fiber in which two or more kinds of polyester-based polymers, at least one of which consists essentially of polytrimethylene terephthalate, are stuck along the fiber length direction side-by-side, or an eccentric sheath-core type conjugate fiber in which two or more kinds of polyester-based polymers, at least one of which consists essentially of polytrimethylene terephthalate, forms an eccentric sheath-core type structure, and the fiber constituting the woven or knitted fabric has a twist coefficient of 20000 or below.

$$\text{twist coefficient } K = T \times D^{0.5}$$

where, T: number of twists per one meter of fiber yarn (times)

D: fineness of fiber yarn (dtex)

2. The leather-like sheet according to claim 1, which includes a polymeric elastomer by less than 5 wt%.

3. The leather-like sheet according to claim 1, which is composed substantially of a fiber material and contains substantially no polymeric elastomer.

4. The leather-like sheet according to any one of claims 1 to 3, which is composed of the ultrafine fibers entangled with each other, and also includes ultrafine staple fibers of a fiber length of 10 to 100 mm.

5. The leather-like sheet according to any one of claims 1 to 4, wherein an abrasion loss is 20 mg or less in an abrasion test by Martindale method when the surface thereof is worn 20000 times, and number of pills is

five or less.

6. The leather-like sheet according to any one of claims 1 to 5, wherein both of the two kinds of polyester-based polymers are polyesters consisting essentially of polytrimethylene terephthalate.

7. The leather-like sheet according to any one of claims 1 to 5, wherein one of the two kinds of polyester-based polymers is polyester consisting essentially of polyethylene terephthalate, and the other is polyester consisting essentially of polytrimethylene terephthalate.

8. The leather-like sheet according to any one of claims 1 to 7, wherein the conjugate fiber made of the two kinds of polyester-based polymers has curvature radius R of a composite interface in a fiber cross section within a range of following expression,

$$\text{curvature radius } R \text{ } (\mu\text{m}) \geq 10 d^{0.5}$$

where, d : single fiber fineness (dtex)

9. The leather-like sheet according to any one of claims 1 to 7, wherein the conjugate fiber made of the two kinds of polyester-based polymers has a fiber cross section in a flat shape having a composite interface in a minor-axis direction, and a flatness degree expressed by a ratio of major axis to minor axis of the cross section is within a range of 1.3 to 6.

10. The leather-like sheet according to any one of claims 1 to 9, wherein the conjugate fiber consisting of the two kinds of polyester-based polymers has crimps caused by false-twisting.

11. The leather-like sheet according to any one of claims 1 to 10, wherein the number of twists T of a fiber yarn constituting the woven or knitted fabric is 0 to 3000 times/m.

12. The leather-like sheet according to any one of claims 1 to 11, wherein the ultrafine fiber is polyester ultrafine fiber.

13. The leather-like sheet according to any one of claims 1 to 12, of which at least one of surfaces is napped.

14. The leather-like sheet according to any one of claims 1 to 13, wherein an elongation ratio in at least one direction is 10 to 50%, and an elongation recovery ratio thereof is 75 to 100%.

15. The leather-like sheet according to any one of claims 1 to 14, wherein the elongation ratio in a longitudinal direction is 5 to 30%, the elongation ratio in a transverse direction is 10 to 50%, and the elongation ratio in the transverse longitudinal direction is larger than that in the longitudinal direction.

16. The leather-like sheet according to claim 15, wherein the elongation recovery ratio in the longitudinal and transverse directions are 75 to 100%.

17. The leather-like sheet according to any one of claims 1 to 16, which includes fine particles.

18. The leather-like sheet according to claim 17, wherein a diameter of the fine particle is 0.001 to 30  $\mu\text{m}$ .

19. A method for producing a leather-like sheet, comprising the steps of:

integrating by entanglement of ultrafine fibers of 0.0001 to 0.5 dtex and a woven or knitted fabric which consists of a conjugate fiber in which two or more kinds of polyester-based polymers are stuck along the fiber length direction side-by-side, or a conjugate fiber, having an eccentric sheath-core structure in which two or more kinds of polyester-based polymers are eccentrically conjugated, made of polyester in which at least one of two or more kinds of polyester-based polymers consists essentially of polytrimethylene terephthalate, and

applying a shrinking treatment thereafter.

20. A method for producing a leather-like sheet, comprising the steps of;

applying a shrinking treatment on a woven or knitted fabric which consists of a conjugate fiber in which two or more kinds of polyester-based polymers are stuck along the fiber length direction side-by-side, or a conjugate fiber having an eccentric sheath-core structure in which two or more kinds of polyester-based polymers are eccentrically conjugated, made of polyester in which at least one of two or more kinds of polyester-based polymers consists essentially of polytrimethylene terephthalate, and

integrating by entanglement of a nonwoven fabric consisting of ultrafine fibers of 0.0001 to 0.5 dtex and the woven or knitted fabric.

21. The method for producing a leather-like sheet according to claim 19 or 20, wherein for the conjugate fiber, a temperature on a maximum shrinkage stress is 110 to 200°C, a maximum value of the shrinkage stress is 0.15 to 0.50 cN/dtex, and an stretch elongation ratio after the shrinking treatment is 30 to 250%.

22. The method for producing a leather-like sheet according to any one of claims 19 to 21, wherein integration by entanglement is carried out by water-jet punching treatment using high-speed fluid when integrating by entanglement of the ultrafine fibers and the woven or knitted fabric.

23. The method for producing a leather-like sheet according to any one of claims 19 to 22, when integrating by entanglement of the ultrafine fibers and the woven or knitted fabric, comprising the steps of;

producing a nonwoven fabric consisting of ultrafine fibers of 0.0001 to 0.5 dtex with a weight per unit area of 10 to 350 g/m<sup>2</sup> by needle punching treatment,

laminating the woven or knitted fabric on the nonwoven fabric, and integrating by entanglement through a high-speed fluid punching treatment using the high-speed fluid.

24. The method for producing a leather-like sheet according to any one of claims 19 to 23, when integrating by entanglement of the ultrafine fibers and the woven or knitted fabric, comprising the steps of:

entangling composite fiber convertible into a bundle of fine fibers which can generate ultrafine fibers of 0.0001 to 0.5 dtex through the needle punching treatment to produce a nonwoven fabric,

generating the ultrafine fibers for obtaining a nonwoven fabric of the ultrafine fibers with a weight per unit area of 10 to 350 g/m<sup>2</sup>,

laminating the woven or knitted fabric on the nonwoven fabric, and integrating by entanglement through high-speed fluid punching treatment under a pressure of 10 MPa or more.

25. The method for producing a leather-like sheet according to any one of claims 22 to 24, comprising the step in which high-speed fluid treatment is carried out using a fluid-jet nozzle having a fluid-jet hole of a diameter of 0.06 to 0.15 mm.

26. The method for producing a leather-like sheet according to claim 24 or 25, wherein composite fiber convertible into a bundle of fine fibers are sea-island type conjugate fibers.

27. The method for producing a leather-like sheet according to any one of claims 19 to 26, comprising the step of applying the shrinking treatment of shrinking to shrinking ratio of 5 to 50% in length in at least one direction.